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Weather or Not?

VOLUME 6, ISSUE 1 SEPTEMBER 2012

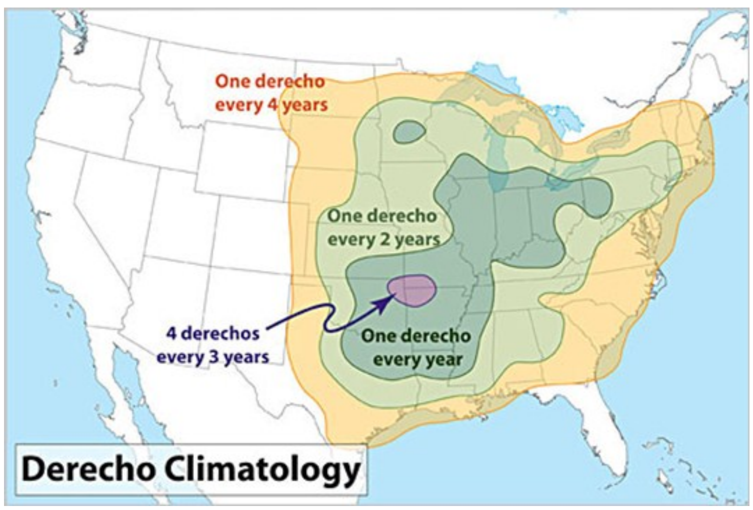
Unusual Weather Phenomenon: The Derecho

& The Ohio Valley / Mid-Atlantic Derecho of June 2012

By Joe Sirard, based upon information courtesy of NOAA's Storm Prediction Center

Although southern California experiences a wide variety of weather, especially in the rainy season, this region of the country will never experience a unique kind of convective event called the derecho. These weather events can occur from the Great Basin to the east coast during the warm season, but are most prevalent east of the Rockies.

A derecho (pronounced similar to "deh-REY-cho") is a widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. Although a derecho can produce destruction similar to that of tornadoes, the damage typically is directed in one direction along a relatively straight swath. As a result, the term "straight-line wind damage" sometimes is used to describe derecho damage. By definition, if the wind damage swath extends more than 240 miles and includes wind gusts of at least 58 mph or greater along most of its length, then the event may be classified as a derecho.



This article will highlight a significant derecho which occurred on June 29, 2012 from northern Indiana to the mid-Atlantic coast, and the actions the National Weather Service took along its path.

While not the most intense or long-lived event ever observed, the June 29, 2012 Ohio Valley / Mid Atlantic derecho was noteworthy in producing the all-time highest recorded June or July wind gusts at several official observing sites along its path (Fort Wayne, Indiana, Zanesville, Ohio, and Huntington, West Virgina), in addition to widespread, significant wind damage. Five million people lost power from Chicago to the mid Atlantic Coast, and 22 were killed. The storm also was notable for being arguably the first derecho to capture widespread media attention, striking as it did nearly every metropolitan area in a broadening path that extended from Chicago and Indianapolis to Baltimore, Washington, and Tidewater Virginia.

As with a sizable percentage of warm-season events, the parent convective system associated with the Ohio Valley / Mid-Atlantic derecho arose from *elevated thunderstorms*; that is, storms that formed in a layer of unstable air located above a

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Office Comings and Goings

By Joe Sirard

NWS Oxnard welcomes our new Science and Operations Officer (SOO), John Dumas, a recently retired U.S. Navy Commander. His last duty station was at the Naval Postgraduate School in Monterey, where John was in charge of the Meteorology, Oceanography and Undersea Warfare curricula.

We also welcome new forecaster Kathy Hoxsie, who transferred to NWS Oxnard from the NWS Sacramento office.

Unusual Weather Phenomenon: The Derecho

For more information about derechos please visit the following web site:

http://www.spc.noaa.gov/misc/AbtDerechos/derechofacts.htm

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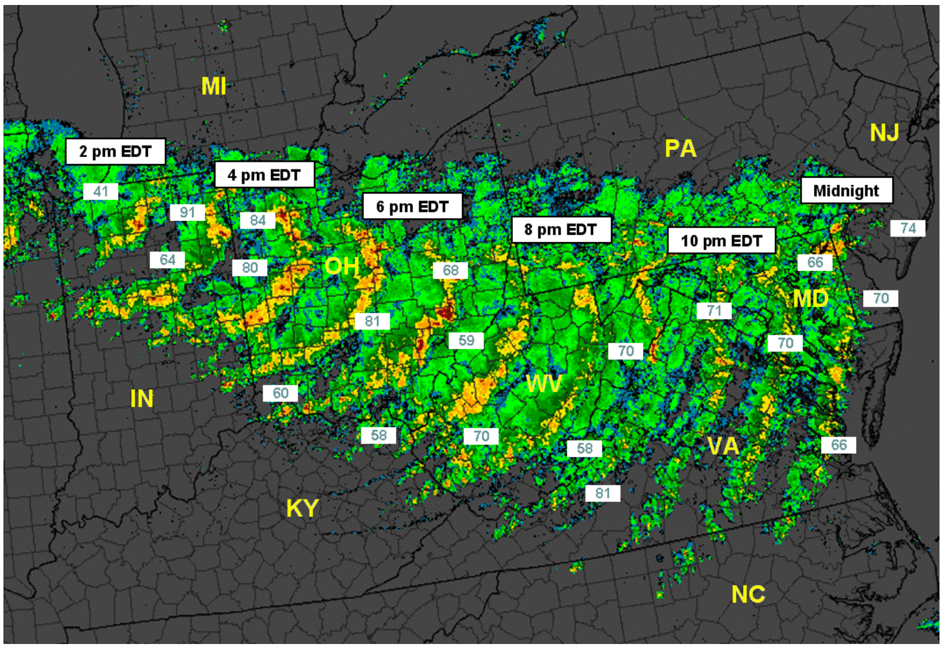
frontal surface. In this case, the storms formed during the early morning (CDT) of Friday, June 29th over eastern Iowa, where a modest band of moist, southwesterly low-level winds (known as the "nocturnal low level jet") intersected a weak stationary front. The front extended east into central Ohio and southern Pennsylvania, and served, in part, as a guide along which the derecho would move later in the day. The boundary separated hot, very humid air (with afternoon temperatures near 100 F and surface dewpoints around 70 F) from slightly cooler and drier air to the north.

Storms in Iowa and Illinois produced scattered instances of severe hail and damaging wind, including 60 mph gusts near Chicago, but were not otherwise noteworthy. By early afternoon, however, the convection strengthened as it moved into northern Indiana. While these thunderstorms likely were still slightly elevated above the frontal surface, they nevertheless began to "bow" downstream toward Fort Wayne, producing swaths of 60-70 mph winds that toppled numerous trees and power lines. Around the same time, new storms began to form farther south across central Indiana as surface heating destabilized the region along the stalled front and enabling a capping inversion to be breached.



Composite display of hourly radar reflectivity imagery, showing development and evolution of the June 29, 2012 derecho-producing convective system, with selected observed wind gusts (mph). Time is EDT, and ranges from 2 p.m. Friday, June 29 (1800 UTC June 29, far left) to 12:00 midnight Friday-Saturday, June 29-30 (0400 UTC June 30, far right). (Base image by G. Carbin, NOAA Storm Prediction Center)

Thunderstorms expanded rapidly east along the front to join the strengthening bow as the latter feature entered Ohio from northeast Indiana. By 4 p.m. (EDT), an intense squall line developed that arced from south of Toledo, Ohio through the Dayton area to near Indianapolis. Scattered 80 mph gusts in the evolving derecho not only downed countless trees and power lines, but also blew roofs off homes,

Photo of the shelf cloud that preceded the derecho in LaPorte, IN (courtesy of Kevin Gould)

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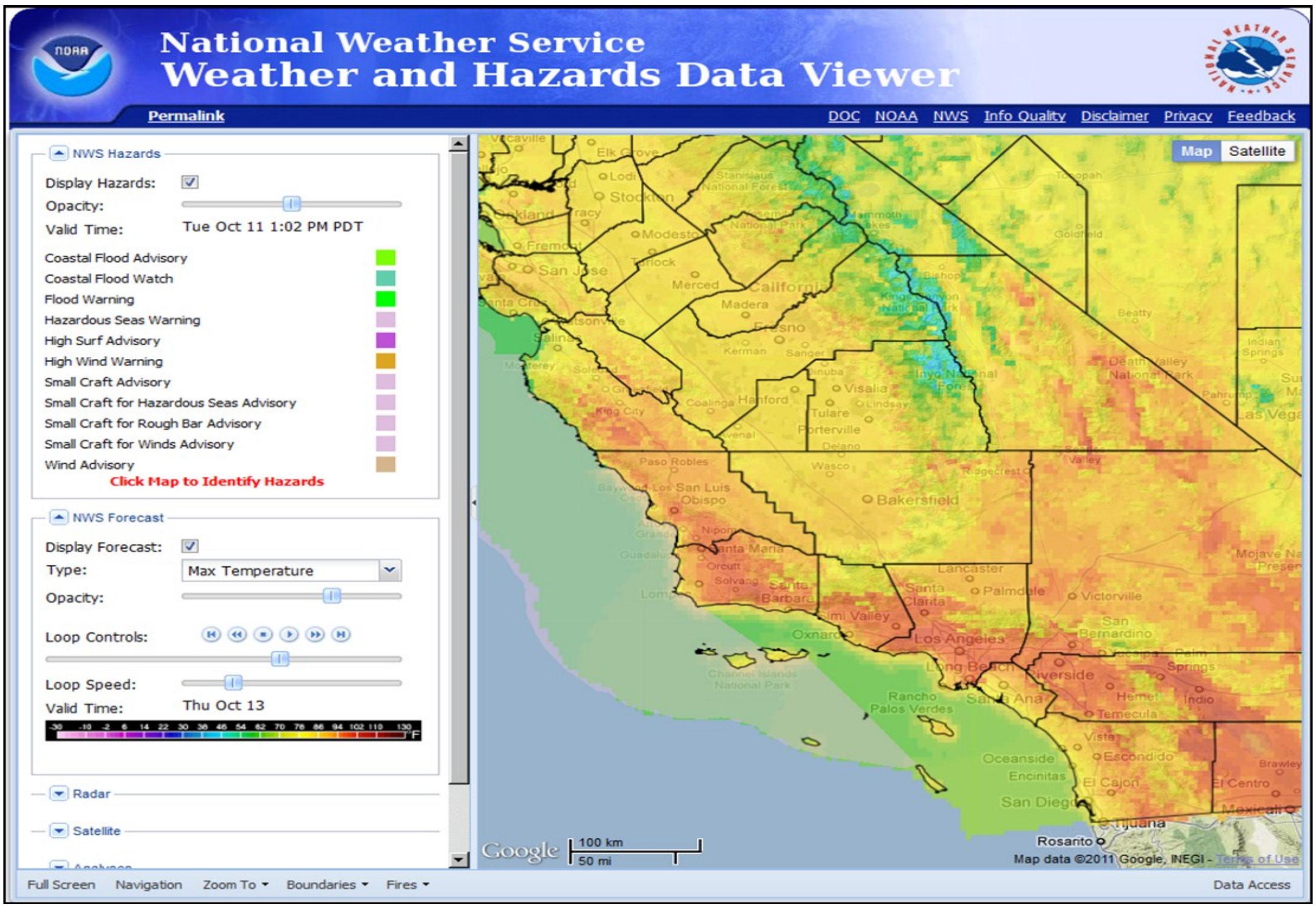
NWS Weather and Hazards Data Viewer

Recently the National Weather Service (NWS) Weather and Hazards Data Viewer was developed. This viewer provides user access to weather forecasts and hazards planning data in an Internet mapping tool for the purpose of monitoring storms and their associated hazards. A unique feature of this viewer is providing the ability for users to visualize potential impacts of storms. The forecast weather information is provided by the National Oceanic and Atmospheric Administration (NOAA) National Weather Service National Digital Forecast Database (NDFD).

The viewer provides the visual extents, as well as the text, of advisory and warning products that have been issued, forecast images of temperature, wind speed and direction, relative humidity, precipitation and significant ocean wave heights, radar images with looping capability, satellite images, and weather station observations.

Give the NWS Weather and Hazards Viewer a try at:
http://www.wrh.noaa.gov/wrh/whv/



Weather and Hazards Data Viewer displaying a maximum temperature forecast.

From Your Spotter Coordinator, Joe Sirard

Hello Spotters! We look far and wide for this issue as we examine a unique weather phenomena called the derecho. You may have heard about it in the news in late June as a derecho caused tremendous damage and loss of life from Indiana through the mid-Atlantic region. Fortunately we do not experience derechos in southern California, but we have our fair share of severe weather from time to time, and I always want to extend gratitude to all the storm spotters in our region who continue to assist the forecasters in the warning decision process.

For the first time, climate summaries have been included in the spotter newsletter. These summaries are for July 2011-June 2012 for several key climate stations across the area and include data from the full rainy season.

I hope you enjoy this edition of *Weather or Not?*. If you have any comments or questions please send along an email.

Climate Summaries 2011-2012

The following tables show the annual climate summaries for several key stations across southwestern California. These summaries are for July 2011-June 2012, showing the seasonal rainfall and percentage of normal. Overall, rainfall was in the 45-65 percent of normal range for the year across the region. Temperatures were largely below normal for Ventura and Los Angeles Counties, except above normal in January, and above normal for most months in the Antelope Valley. Temperatures were mostly above normal for Santa Barbara and San Luis Obispo Counties.

Downtown Los Angeles (USC) Annual Climate Summary

	2011-2012	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
TEMPERATURE (°F)	Ave. Maximum	80.7	81.7	79.1	76.7	69.2	65.7	70.6	67.1	67.3	72.5	73.2	75.7
	Departure from Normal	-2.4	-2.7	-4.0	-1.8	-3.6	-2.0	+2.4	-1.5	-2.9	-0.2	-1.3	-2.4
	Ave. Minimum	63.5	62.8	62.0	57.4	51.0	43.7	47.5	48.0	49.2	52.7	57.7	60.3
	Departure from Normal	-0.1	-1.3	-1.1	-1.3	-1.0	-3.8	-0.3	-1.3	-1.8	-0.8	+0.6	0.0
	Monthly Average	72.1	72.2	70.6	67.0	60.1	54.7	59.1	57.6	58.2	62.6	65.5	68.0
	Departure from Normal	-1.2	-2.1	-2.5	-1.6	-2.3	-2.9	+1.1	-1.3	-2.4	-0.5	-0.3	-1.2
	Highest for Month	89	93	97	99	82	76	86	80	87	85	81	82
	Date(s)	5	8	6	12	2,26, 27	28	4	9	4	25	16	27
	Lowest for Month	60	59	57	50	44	37	42	41	42	44	54	58
	Date(s)	17,20, 24	6,7, 31	3	27	7	6	19	16	8	14	4,26	6,25, 26
	# Days Max >=90	0	3	3	2	0	0	0	0	0	0	0	0
	# Days Min <=32	0	0	0	0	0	0	0	0	0	0	0	0
PRECIPITATION (In.)	Monthly Total	0.00	0.00	T	1.17	1.58	1.01	1.30	0.16	1.75	1.71	0.01	0.00
	Departure from Normal	-0.01	-0.04	-0.24	+0.51	+0.54	-1.32	-1.82	-3.64	-0.68	+0.80	-0.25	-0.09
	Greatest in 24 hours	0.00	0.00	T	1.15	0.90	0.96	0.68	0.13	0.95	0.73	0.01	0.00
	Date(s)			4,5,10 23,30	5	20	12-13	21	15	25-26	10-11	25	
	# of days >=0.01 in.	0	0	0	2	4	4	2	4	5	5	1	0
	Seasonal Total	0.00	0.00	T	1.17	2.75	3.76	5.06	5.22	6.97	8.68	8.69	8.69
	Departure from Normal	-0.01	-0.05	-0.29	+0.22	+0.76	-0.56	-2.38	-6.02	-6.70	-5.90	-6.15	-6.24
	Compared to Normal for Season (%)	0	0	0	123	138	87	68	46	51	60	59	58
WIND (mph)	Peak Speed	10	10	12	12	17	23	12	14	15	16	10	12
	Direction	270	270	270	270	330	010	270	020	140	310	270	270
	Date(s)	1,13,16, 18,27,29	25	30	4	30	1	21,23, 31	13,16	25	1	3,6,13 23,25	5
	Peak Gust	16	17	23	20	29	44	21	28	31	28	23	18
	Direction	270	270	160	270	330	010	280	030	270	260	270	270
	Date(s)	29	26	5	4,5	30	1	21	16	18	25	25	5

Climate Summaries 2011-2012

Burbank (Bob Hope Airport) Annual Climate Summary

	2011-2012	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
TEMPERATURE (°F)	Ave. Maximum	85.4	88.8	85.0	80.1	68.6	65.5	71.0	66.9	67.1	73.1	76.8	79.5
	Departure from Normal	-1.1	+0.7	-1.1	+0.4	-4.4	-1.5	+3.2	-1.1	-3.1	-0.1	+0.6	-1.0
	Ave. Minimum	63.5	63.3	62.0	55.5	46.9	41.0	45.1	44.6	46.5	50.4	55.5	58.4
	Departure from Normal	+1.2	+0.9	+1.9	+1.5	+0.9	-0.2	+3.2	+0.7	+0.1	+0.5	+0.8	-0.1
	Monthly Average	74.5	76.0	73.5	67.8	57.8	53.2	58.0	55.7	56.8	61.7	66.1	68.9
	Departure from Normal	+0.1	+0.7	+0.4	+0.9	-1.7	-0.9	+3.2	-0.2	-1.5	+0.2	+0.7	-0.6
	Highest for Month	95	107	101	99	82	80	85	80	86	95	92	89
	Date(s)	1	26	7	12,13	2,26, 27	31	4,25	9,24	4	20	20	17
	Lowest for Month	58	58	57	46	40	34	37	37	38	39	49	54
	Date(s)	16,17	7	1,18	27,28	7,8, 22	6,7	18,19	28	19	14	26	6
	# Days Max >=90	11	13	6	4	0	0	0	0	0	1	1	0
	# Days Min <=32	0	0	0	0	0	0	0	0	0	0	0	0
PRECIPITATION (In.)	Monthly Total	T	0.00	T	0.59	1.93	0.77	0.85	0.06	2.43	2.14	T	0.00
	Departure from Normal	-0.02	-0.07	-0.23	-0.38	+0.86	-1.63	-2.68	-4.42	-0.54	+1.03	-0.35	-0.11
	Greatest in 24 hours	T	0.00	T	0.53	1.13	0.74	0.50	0.03	1.40	0.89	T	0.00
	Date(s)	31		10,30	5	19-20	12-13	23	15	25-26	13	1,2,25	
	# of days >=0.01 in.	0	0	0	2	5	4	2	3	5	5	0	0
	Seasonal Total	T	T	T	0.59	2.52	3.29	4.14	4.20	6.63	8.77	8.77	8.77
	Departure from Normal	-0.02	-0.09	-0.32	-0.70	+0.16	-1.47	-4.15	-8.57	-9.11	-8.08	-8.43	-8.54
	Compared to Normal for Season (%)	0	0	0	46	107	69	50	33	42	52	51	51
WIND (mph)	Peak Speed	16	18	16	22	38	35	28	32	29	31	20	20
	Direction	160	270	200	120	030	050	040	030	140	200	160	280
	Date(s)	5	26	30	5	30	17	27	16	25	25	25	5
	Peak Gust	24	25	24	28	55	52	33	39	39	38	28	26
	Direction	220	100	120	130	040	010	040	040	150	330	080	290
	Date(s)	26	2	27	5	30	1	27	16	25	1	31	5

Climate Summaries 2011-2012

Palmdale Airport Annual Climate Summary

	2011-2012	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
TEMPERATURE (°F)	Ave. Maximum	96.0	98.7	94.1	81.5	63.4	57.9	64.6	62.3	67.1	75.8	86.2	91.9
	Departure from Normal	-1.5	+1.2	+3.6	+3.0	-3.3	-0.4	+6.0	+0.7	+0.5	+3.3	+3.3	+0.9
	Ave. Minimum	66.2	65.3	61.0	48.8	36.4	27.9	30.9	33.8	37.5	44.6	54.3	59.6
	Departure from Normal	+1.3	+0.3	+3.9	+1.0	-0.3	-2.7	-0.5	-1.7	-1.8	+1.0	+2.1	+0.7
	Monthly Average	81.1	82.0	77.5	65.1	49.9	42.9	47.7	48.1	52.3	60.2	70.2	75.7
	Departure from Normal	-0.1	+0.8	+3.7	+1.9	-1.8	-1.5	+2.7	-0.4	-0.7	+2.2	+2.7	+0.7
	Highest for Month	107	107	101	94	80	77	74	77	79	95	102	102
	Date(s)	2	26	7	13,14	1	30	19,26	23	5,30	21	31	16,17, 20
	Lowest for Month	52	56	53	34	29	19	21	25	26	29	44	49
	Date(s)	17	4	1	28	8,9	7	13,17	4	3	7	26	5,6,7
	# Days Max >=90	26	31	24	5	0	0	0	0	0	3	13	22
	# Days Min <=32	0	0	0	0	8	24	22	10	6	1	0	0
PRECIPITATION (In.)	Monthly Total	0.14	T	0.85	0.14	0.45	0.35	0.09	0.43	0.65	0.62	T	0.00
	Departure from Normal	+0.04	-0.14	+0.56	-0.46	-0.25	-0.80	-1.48	-1.29	-0.57	+0.15	-0.25	-0.09
	Greatest in 24 hours	0.12	T	0.85	0.14	0.24	0.34	0.09	0.20	0.44	0.54	T	0.00
	Date(s)	5	1,27	10	5	19-20	12	23	15	17	13	25	
	# of days >=0.01 in.	2	0	1	1	4	2	1	4	3	2	0	0
	Seasonal Total	0.14	0.14	0.99	1.13	1.58	1.93	2.02	2.45	3.10	3.72	3.72	3.72
	Departure from Normal	+0.04	-0.10	+0.46	0.00	-0.25	-1.05	-2.53	-3.82	-4.39	-4.24	-4.49	-4.58
	Compared to Normal for Season (%)	140	58	187	100	86	65	44	39	41	47	45	45
WIND (mph)	Peak Speed	29	31	36	32	43	44	41	37	45	44	51	38
	Direction	230	220	220	210	300	040	290	280	230	300	290	300
	Date(s)	22	3	10	5	30	1	21	19	16	1	23	5
	Peak Gust	35	37	49	40	53	52	51	45	55	51	58	44
	Direction	240	210	080	220	300	030	290	290	230	300	280	290
	Date(s)	22	3	22	5	30	1	21	19	16	1	23	5

Climate Summaries 2011-2012

Santa Barbara Airport Annual Climate Summary

	2011-2012	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
TEMPERATURE (°F)	Ave. Maximum	72.3	71.5	70.5	71.5	66.1	63.6	66.7	65.1	63.1	64.7	70.1	69.5
	Departure from Normal	-1.0	-2.9	-3.7	-0.5	-2.2	0.0	+3.2	+1.4	-2.1	-2.6	+1.1	-1.2
	Ave. Minimum	57.8	56.1	55.3	51.7	43.2	36.3	38.9	41.7	41.8	46.1	50.6	53.8
	Departure from Normal	0.0	-1.5	-0.5	+0.6	-1.2	-3.9	-1.8	-2.0	-4.0	-1.7	-0.6	-0.4
	Monthly Average	65.0	63.8	62.9	61.6	54.7	50.0	52.8	53.4	52.5	55.4	60.3	61.7
	Departure from Normal	-0.5	-2.2	-2.1	0.0	-1.6	-1.9	+0.7	-0.3	-3.0	-2.1	+0.2	-0.7
	Highest for Month	79	80	87	90	78	71	85	75	78	73	86	84
	Date(s)	5	27	7	12	27	28	26	22,23	9	4	23	6
	Lowest for Month	52	52	51	43	35	31	33	36	33	38	46	48
	Date(s)	14	4,31	13,18, 26	27,28 29	9	24,25, 26	13	17,29	8	7,9	14,15 27	25
	# Days Max >=90	0	0	0	1	0	0	0	0	0	0	0	0
	# Days Min <=32	0	0	0	0	0	3	0	0	0	0	0	0
PRECIPITATION (In.)	Monthly Total	T	0.00	0.00	0.85	3.03	1.09	2.09	0.08	2.28	2.24	0.00	0.01
	Departure from Normal	-0.03	-0.12	-0.26	+0.04	+1.48	-1.85	-1.41	-3.88	-0.90	+1.24	-0.34	-0.06
	Greatest in 24 hours	T	0.00	0.00	0.80	2.07	1.07	1.40	0.07	0.99	1.29	0.00	0.01
	Date(s)	3			5	20-21	11-12	21	7	25	10-11		15
	# of days >=0.01 in.	0	0	0	4	4	3	3	2	5	9	0	1
	Seasonal Total	T	T	T	0.85	3.88	4.97	7.06	7.14	9.42	11.66	11.66	11.67
	Departure from Normal	-0.03	-0.15	-0.41	-0.37	+1.11	-0.74	-2.15	-6.03	-6.93	-5.69	-6.03	-6.09
	Compared to Normal for Season (%)	0	0	0	70	140	87	77	54	58	67	66	66
WIND (mph)	Peak Speed	17	15	21	25	26	29	30	37	31	35	28	30
	Direction	260	260	080	330	120	010	350	140	270	030	310	270
	Date(s)	31	20	13	6	12	1	21	7	17	1	17	5
	Peak Gust	22	20	28	39	46	38	41	41	40	45	35	32
	Direction	250	340	180	300	090	360	360	360	300	030	290	020
	Date(s)	30	18	23	6	11	1	21	13	6	1	25	6

Climate Summaries 2011-2012

Santa Maria Airport Annual Climate Summary

	2011-2012	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
TEMPERATURE (°F)	Ave. Maximum	73.0	71.5	73.7	75.6	67.5	64.6	66.9	66.1	65.9	68.5	69.0	71.2
	Departure from Normal	+0.4	-1.6	0.0	+2.6	-1.0	+1.2	+3.5	+2.1	+0.8	+1.3	+0.5	+0.8
	Ave. Minimum	54.6	54.3	54.2	50.9	42.4	35.4	38.3	40.2	40.9	44.9	46.8	49.9
	Departure from Normal	+0.8	+0.1	+1.5	+2.2	-0.6	-3.7	-1.2	-1.5	-2.1	+0.9	-0.6	-0.7
	Monthly Average	63.8	62.9	64.0	63.3	54.9	50.0	52.6	53.2	53.4	56.7	57.9	60.5
	Departure from Normal	+0.6	-0.8	+0.8	+2.4	-0.9	-1.2	+1.1	+0.4	-0.6	+1.1	-0.1	0.0
	Highest for Month	91	77	90	100	79	82	77	83	83	81	82	79
	Date(s)	2	15,24	7	13	2	31	13	22	4	19,20	6	10
	Lowest for Month	50	50	50	42	35	29	27	31	30	34	43	43
	Date(s)	18	1	18,19	27,28	8	4,23	17,18	28	7	6,7	14,25	5,10
	# Days Max >=90	1	0	1	2	0	0	0	0	0	0	0	0
	# Days Min <=32	0	0	0	0	0	11	3	1	2	0	0	0
PRECIPITATION (In.)	Monthly Total	T	0.00	0.09	0.75	1.50	0.16	1.81	0.36	2.72	2.31	T	T
	Departure from Normal	-0.03	-0.02	-0.05	+0.15	+0.17	-1.96	-0.94	-2.63	+0.08	+1.33	-0.31	-0.04
	Greatest in 24 hours	T	0.00	0.09	0.65	0.83	0.14	0.95	0.22	1.30	1.08	T	T
	Date(s)	30		10	5-6	20	12	20-21	13	17-18	12-13	1	21,30
	# of days >=0.01 in.	0	0	1	4	6	2	3	4	7	8	0	0
	Seasonal Total	T	T	0.09	0.84	2.34	2.50	4.31	4.67	7.39	9.70	9.70	9.70
	Departure from Normal	-0.03	-0.05	-0.10	+0.05	+0.22	-1.74	-2.68	-5.31	-5.23	-3.90	-4.21	-4.25
	Compared to Normal for Season (%)	0	0	47	106	110	59	62	47	59	71	70	70
WIND (mph)	Peak Speed	24	28	24	28	29	28	28	36	38	33	35	35
	Direction	300	230	300	240	150	020	310	140	300	300	290	300
	Date(s)	17	21	26	7,27	11	1	21	7	6	5	23	5
	Peak Gust	32	30	36	38	39	40	38	37	46	40	43	43
	Direction	290	300	310	220	140	270	050	300	300	280	300	280
	Date(s)	13	7	25	27	11	12	27	13,17	6	27	23	5

Climate Summaries 2011-2012

Paso Robles Airport Annual Climate Summary

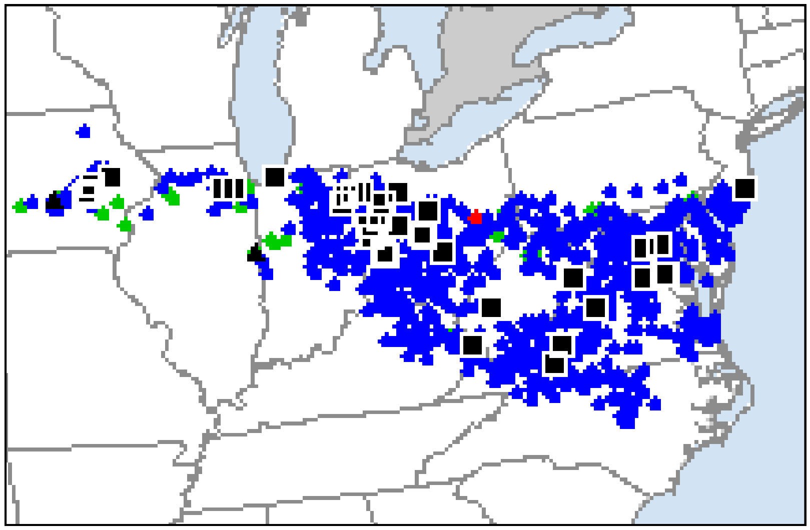
	2011-2012	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
TEMPERATURE (°F)	Ave. Maximum	91.0	93.2	92.5	80.7	64.9	62.2	65.2	65.4	67.0	73.9	85.2	88.3
	Departure from Normal	-1.8	+0.4	+4.1	+1.7	-2.1	+3.0	+5.7	+3.4	+0.6	+1.4	+4.5	+0.9
	Ave. Minimum	54.5	52.2	52.2	46.6	38.1	27.7	30.9	35.1	37.6	42.9	44.6	48.7
	Departure from Normal	+0.4	-1.3	+1.7	+2.2	+0.3	-6.0	-4.0	-3.1	-2.4	+1.7	-1.4	-1.6
	Monthly Average	72.7	72.7	72.4	63.7	51.5	45.0	48.1	50.3	52.3	58.4	64.9	68.5
	Departure from Normal	-0.7	-0.5	+3.0	+2.0	-0.9	-1.4	+0.9	+0.2	-0.9	+1.5	+1.6	-0.4
	Highest for Month	107	104	105	94	82	70	76	80	83	96	101	107
	Date(s)	2,3	27	7	13	2	28	4,13	24	5	21	31	16
	Lowest for Month	49	48	44	34	31	20	17	26	24	29	38	41
	Date(s)	15,27	16,29,31	4	27,28	9	23,25	17	16,26,28	8	6,7	6	9
	# Days Max >=90	18	22	19	5	0	0	0	0	0	3	11	15
	# Days Min <=32	0	0	0	0	2	23	19	9	7	4	0	0
PRECIPITATION (In.)	Monthly Total	0.00	0.00	0.01	0.98	1.75	0.07	1.49	0.14	2.32	1.92	T	0.00
	Departure from Normal	-0.01	-0.11	-0.21	+0.36	+0.72	-1.94	-1.26	-2.45	-0.17	+1.24	-0.26	-0.02
	Greatest in 24 hours	0.00	0.00	0.01	0.45	0.78	0.07	078	0.07	1.52	1.37	T	0.00
	Date(s)			11	4-5	19-20	12	22-23	7	16-17	13	25	
	# of days >=0.01 in.	0	0	1	4	6	1	3	3	6	5	0	0
	Seasonal Total	0.00	0.00	0.01	0.99	2.74	2.81	4.30	4.44	6.76	8.68	8.68	8.68
	Departure from Normal	-0.01	-0.12	-0.33	+0.03	+0.75	-1.19	-2.45	-4.90	-5.07	-3.83	-4.09	-4.11
	Compared to Normal for Season (%)	0	0	3	103	138	70	64	48	57	69	68	68
WIND (mph)	Peak Speed	28	25	26	25	24	33	25	22	32	28	33	30
	Direction	200	320	200	190	350	360	260	230	330	210	330	330
	Date(s)	28	25	24	5	30	1	23	29	6	22	23	2
	Peak Gust	33	39	32	35	33	41	31	40	33	37	43	38
	Direction	200	200	190	180	070	360	250	330	240	330	320	340
	Date(s)	28	10	24	5	30	1	23	28	17	13	23	2

Unusual Weather Phenomenon: The Derecho

(Continued from page 2)

businesses, and schools, and overturned tractor-trailers. Several people were injured by falling trees and wind-blown debris. A measured 91 mph gust at Fort Wayne was the strongest wind gust ever observed at that observing site during June and July in 61 years of records.

The derecho-producing squall line accelerated east-southeast across central and southern Ohio through the remainder of the afternoon and early evening, reaching northern Kentucky and western West Virginia by 7:00 p.m. It was over the southern half of Ohio that the storm system attained its greatest organization and strength. Tree damage became widespread as the swath of high winds broadened and became nearly continuous, with numerous measured severe gusts observed. An all-time June-July record wind gust of 63 mph was recorded at Zanesville. Structural damage prompted the closing of a shopping mall in Dayton, and a 70-year-old woman was crushed by a collapsing barn near Zanesville. In neighboring Kentucky, a falling tree killed a man in Clark County (east of Lexington).

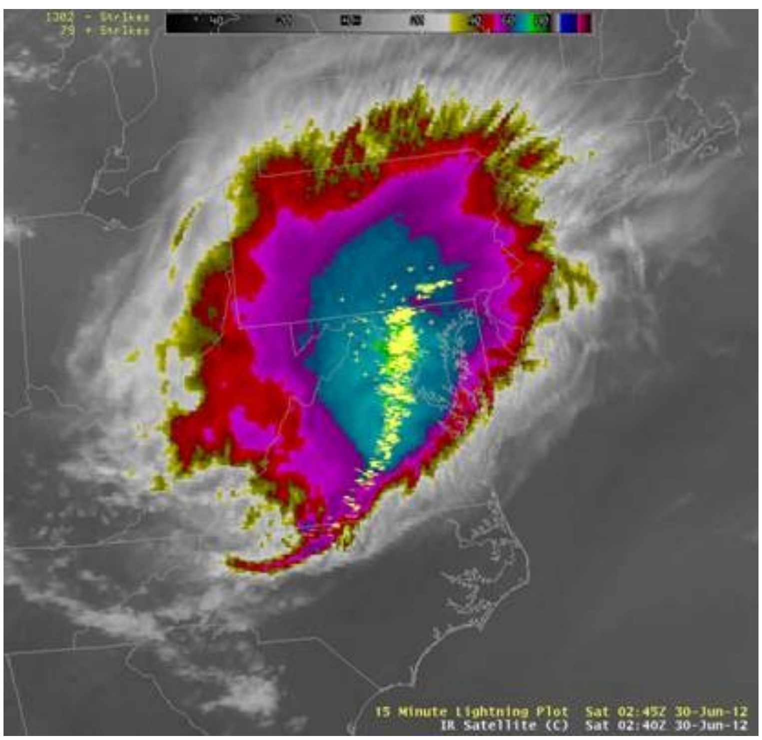


Storm reports associated with the June 29, 2012 derecho. Reports are for the 24-hour period from 7:00 a.m. CDT (1200 UTC) Friday, June 29 to 7:00 a.m. CDT (1200 UTC) Saturday June 30. Some of the reports in Iowa and Illinois are not due to the derecho event discussed here, but to a subsequent storm complex that formed on the evening of June 29. Wind damage or wind gusts ≥ 50 kts (58 mph), blue dots; estimated or measured wind gusts ≥ 65 kts (74 mph), black squares; hail ≥ 0.75 inches, green dots; hail ≥ 2.0 inches, black triangles; tornadoes, red triangles. (Courtesy of the Storm Prediction Center)

During this period, the apex of the system's larger-scale bow tracked east-southeast over central Ohio with an average speed of more than 65 mph.

The derecho raced east across the mountains of West Virginia, western Virginia, far southwest Pennsylvania, and western Maryland during mid-evening, where widespread destruction continued --- mainly to trees. Several people were killed or injured as trees fell onto vehicles and homes. Although radar reflectivity data suggest that the storms slightly weakened during this period, they remained efficient wind producers. Wind damage occurred even along the far southern fringe of the squall line, where little or no cloud-to-ground lightning was observed.

The convective system regained strength as it continued east and southeast of the Appalachians into central Virginia, northern North Carolina, the District of Columbia, and central Maryland later in the evening. The north-south damage swath widened to nearly 300 miles, and more than dozen people were killed or seriously injured by falling trees. The derecho's effects were particularly acute in suburban Washington and Baltimore, where measured 65-75 mph gusts severed numerous overhead electrical feeders. Two people were electrocuted by downed power lines, and more than two million customers lost power. Power in some areas took nearly a week to be restored. In addition, communication disrup-



Viewed by satellite, derechos present an extensive cloud shield produced by the strong updrafts of the thunderstorms comprising a derecho. This is an enhanced infra-red (IR) satellite image taken at 9:40 PM EDT Friday evening (0240 UTC-June 30, 2012) near the time of its impact on the region around the Nation's Capital. Overlaid on this image is the 15 minute sum of lightning cloud-to-ground strikes between 9:30 PM and 9:45 PM EDT. Nearly 1400 strikes are depicted on this image.

(Continued on page 11)

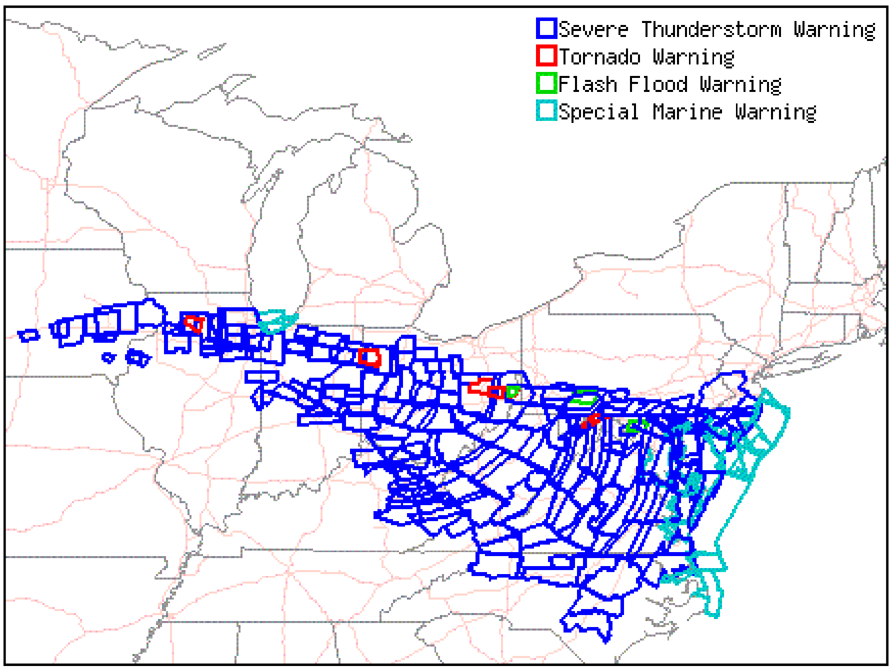
Unusual Weather Phenomenon: The Derecho

(Continued from page 10)

tions were widespread. Near Washington, D.C., loss of power to a key communications facility interrupted 911 service in northern Virginia. Other communication issues involved the loss of both land line and cellular telephone service, and scattered internet outages in the private, government, and commercial sectors. Some of these problems persisted for several days.

By midnight EDT, the squall line extended in a broad arc from northeast of Baltimore to the Virginia-North Carolina border northeast of Raleigh. Wind damage continued as the system moved east across the Chesapeake Bay and the Delmarva Peninsula early Saturday morning (June 30th). Several measured gusts in the 60-70 mph range were reported in Tidewater Virginia and Delaware.

The northern end of the convective system strengthened as it moved into southern New Jersey. The storms in this part of the convective system produced continuous damage that extended east across Delaware Bay to Atlantic City, where a 74 mph gust was reported. Two children were killed at Parvin State Park in Salem County, New Jersey when a tree fell across their camping tent. The derecho-producing system finally weakened upon encountering cooler, maritime air off the Delaware and New Jersey coast around 2 a.m. Saturday.



Local NWS offices issued numerous severe thunderstorm warnings, and several tornado warnings and special marine warnings during the June 29-30 derecho. The above graphic depicts a plot of these warnings.

In summary, the Ohio Valley / Mid Atlantic derecho of June 2012 traveled approximately 700 miles in twelve hours, inflicting untold damage and hardship along a heavily populated corridor through the Midwest and Mid Atlantic states. Nearly two dozen people lost their lives, and many more were seriously injured. Many thousands suffered without power for days in the life-threatening heat wave that persisted after the storm. The storm's impact, particularly on the Nation's Capital, garnered widespread media attention. For the first time, perhaps, the word "derecho" was front-page news. The event, however, was not well forecast. The derecho illustrated that widespread, significant weather conditions can, on occasion, occur in the absence of strong atmospheric disturbances .The storm also once again drew attention to the vulnerablity of suburban areas to derecho winds due to their enhanced exposure to tree and utility line damage.

The NWS Storm Predicition Center worked with NWS field offices to issue four Severe Thunderstorm Watches a few hours in advance of the derecho to notify everyone for the potential of damaging winds. Warnings were issued when that potential turned to expectation. The majority of warnings issued from local NWS offices on June 29th were severe thunderstorms warnings. Although a handful of tornado warnings were issued, there were only 2 confirmed reports of tornadoes associated with the derecho.

For the NWS Baltimore/ Washington Weather Forecast Office (WFO) alone, 15 severe thunderstorm warnings were issued, along with 2 tornado warnings, and 6 special marine warnings. The average lead time for all 15 severe thunderstorm warnings issued by this office was approximately 37 minutes.

Many hundreds of SKYWARN Storm Spotter repots were received by local NWS offices in the path of the derecho which greatly assisted in the warning and verification process across the region.

Although southern California does not have derechos, this area still has the potential for powerful thunderstorms with hail, damaging winds, flash flooding, and on rare occasions tornadoes. Storm spotters in southern California continue to be a valuable asset to NWS Oxnard whenever hazardous weather conditions affect the region. Keep the reports coming in!

Update on the Debris from the Japan Tsunami

By Mark Jackson

The devastating 9.0 earthquake and subsequent tsunami that struck Japan on March 11, 2011, costing over 16,000 lives and injuring over 6,000 people, continues to leave its mark even today. Debris that was washed away into the Pacific Ocean has been gradually drifting away from Japan and is showing up on the western shores and in the coastal waters of North America – including here in California.

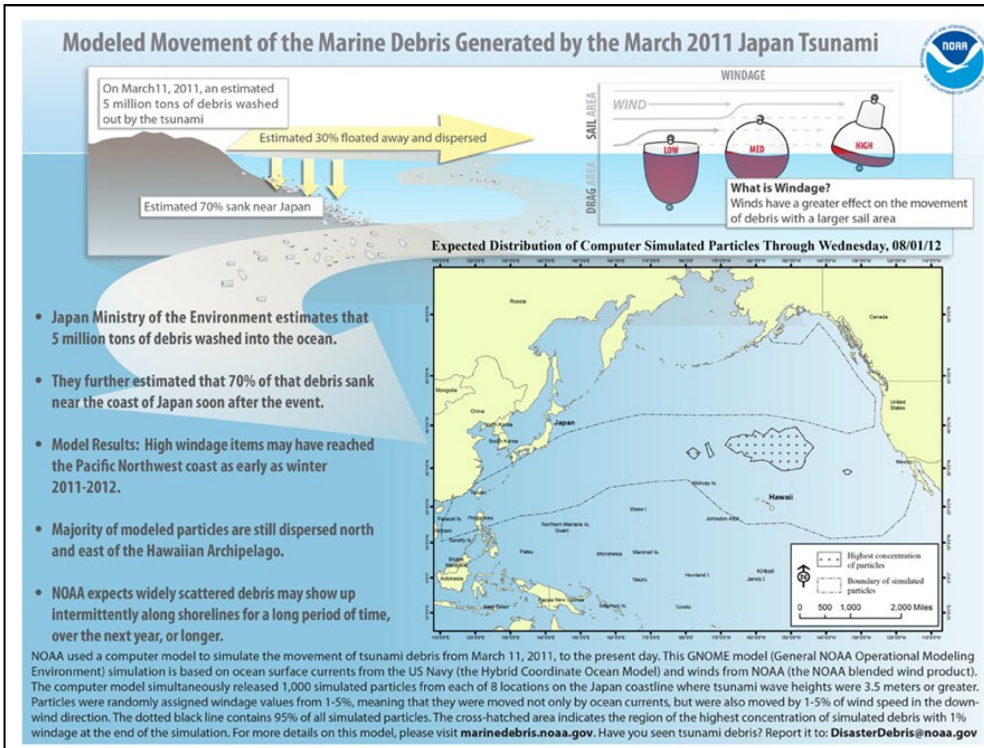
A small boat lost during the tsunami sits on a beach in Cape Disappointment, WA. Credit: WA State Department of Ecology.

The Japanese government estimates that the tsunami swept about 5 million tons of debris into the ocean. Of that, approximately 70 percent sank off shore, leaving 1.5 million tons floating. The debris is also no longer in mass as one large debris patch; rather, it is scattered about the North Pacific. Items that are confirmed to be from the Japan tsunami have been as small as a soccer ball, or as large as a floating pier, or even a vessel. You might wonder if the debris is radioactive. Experts believe it is "highly unlikely" that any of the debris is radioactive.

NOAA's Marine Debris Program plays a crucial role in tracking, identifying, and reporting marine debris that is a result of the Japan tsunami. NOAA is working with state and local partners, along with other federal agencies to ultimately reduce the impacts to our natural resources and coastal communities. Using at-sea observation data from aircraft, satellite, and vessels, NOAA continues to collect and model the debris movement.

You can actually help NOAA in its effort. Even though in some cases it's extremely difficult to identify the marine debris as coming from the tsunami since debris washes up on the Pacific Coast all the time, in other cases it can be quite obvious. In cases where there is clear identification – such as an item with Japanese writing – it's very important that it be reported to NOAA. If any debris is sighted or found, and most importantly tsunami debris, you can send an email to DisasterDebris@noaa.gov, with as much information as possible (such as location, date and time found, any relevant descriptions) provided in the email. Or, you can download and use a Marine Debris Tracker app developed by NOAA in cooperation with the Southeast Atlantic Marine Debris Initiative. You can either go to http://www.marinedebris.engr.uga.edu/, or find the app in the iTunes App store or Google Play.

For comprehensive information on the Japan tsunami debris, and other helpful information on marine debris, just visit http://marinedebris.noaa.gov/tsunamidebris/.



Diversifying Your Communications Portfolio

By Todd Hall

Have your diversified your methods of receiving and relaying information? With the advent of television, mobile phones, and the internet, many are becoming less and less reliant on radios, landline-based telephones and amateur radios. Many disaster plans focus on choosing one contact person to minimize stress on the communication network, but how will you contact them if the communication network is disrupted? If a major weather disaster or large earthquake were to occur, could you rely on mobile phone or landline phone to be working? A power grid failure after a major disaster will likely disrupt the typical communication network for a number of hours and possibly a number of days. Most state and local entities have taken the steps necessary to account communication disruption during an emergency or life-threatening scenario by having many different methods of receiving and distributing information, but have you taken similar steps accordingly to make sure that you are prepared for a crisis situation?

When Hurricane Katrina affected the Gulf Coast in August 29, 2005, many telephones, including most mobile phones, and Internet access were out of service because of line breaks, destruction of base stations, or power failures. Some base stations even had their own back-up generators, but failed due to the duration of the power outage immediately following Hurricane Katrina. All local television and radio stations and newspapers were disrupted throughout the New Orleans area. There was a time period when no information was available about certain parts of the Louisiana and Mississippi portions of the Gulf Coast. In most cases, amateur radio provided as a means of communication, including the law enforcement and first response sectors.

If a similar type emergency scenario to Hurricane Katrina such as a major earthquake, tsunami or major storm system were to occur in Southern California, it is conceivable that communication networks may be disrupted for a number of days. Understand that there are other methods of receiving news and relaying information to your loved ones including: satellite phones, amateur (or HAM) radios, and “All Hazards” NOAA Weather Radio, your single source for comprehensive weather and emergency information. A NOAA Weather Radio can be purchased at any electronic store for as little as $25, with HAM Radio packages starting around $100 plus licensing fees, and satellite phone varying in cost depending upon the price of the handset and contract. By diversifying your ways receiving news and relaying information, you and your family may feel safer in the advent of major life-threatening emergency.

Did you know?

The greatest 24-hour rainfall in California was 26.12 inches which occurred on January 22, 1943 at Hoegees Camp in the foothills of the San Gabriel Mountains above Sierra Madre.

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Los Angeles/Oxnard
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Oxnard, CA 93030

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This Spotter Newsletter is issued as part of the SKYWARN Storm Spotter Program at the Los Angeles/Oxnard National Weather Service Office.

If you are interested in becoming a volunteer Storm Spotter, please access the online training materials at http://www.wrh.noaa.gov/lox/spotter/course/

After reviewing the training slides you will need to take a short quiz. Following the training you will be an official SKYWARN Storm Spotter!

New spotters will receive a packet of information including our Storm Spotter Pocket Guide and a Spotter ID Badge.

Thanks for your interest in the Spotter Program!

What to Report?

Remember to please keep calls short with the information given below, as well as specific times and locations of reports, and a reference to the nearest city/town (if possible). There are many spotters who call at the same time. This helps all calls get through in a timely manner.

Flooding/Debris Flows:
- Rainfall Intensity: How much is falling over a specific period?
- Flooding or Debris Flows that are threatening life/property, or are disrupting traffic.
- Describe the flooding:
  - water depth
  - time it began and ended

Winter Weather:
- Amount, rate and time of new snow accumulations.
- Elevation of snow level
- Icing of roads or road closures
- Very low temperatures:
  - Coast: 35 degrees or lower
  - Valleys: 30 degrees or lower
  - Deserts: 20 degrees or lower
- Significant wind chill

Fog:
- Report visibilities less than or equal to 1/4 mile

Wind:
- Report winds of 30 mph or more
- Speed of winds (sustained or gusts)

Extreme Heat:
- Report for these temperature thresholds:
  - Coast: 95 degrees or higher
  - Valleys: 105 degrees or higher
  - Deserts: 115 degrees or higher

Thunderstorms:
- Estimated location, duration, speed and direction of movement
- Any hail (size, accumulation, etc)
  - 1/4” = pea size
  - 1/2” = marble size
  - 3/4” = penny size
  - 1” = quarter size
  - 1 3/4” = golf ball size
- Wind speeds and gusts
- Rainfall rate and amount
- If lightning strikes any object

Surf:
- Report when surf is 7 feet or greater
- Any flooding or damage caused by high tides and/or high surf

Tornadoes:
- Funnel clouds, waterspouts or any rotating clouds
- Estimated location, duration, speed and direction or movement

Damage or Injuries:
- Please report any confirmed weather-related damage, injuries, or deaths.